



# START620

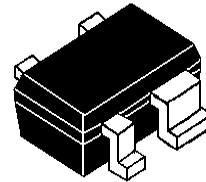
## NPN SiGe RF Transistor

### PRELIMINARY DATA

- LOW NOISE FIGURE:  $NF_{min} = 0.8\text{dB}$   
@ 1.8GHz, 5mA, 2V
- COMPRESSION  $P_{1\text{dB}} = 13\text{dBm}$   
@ 1.8GHz, 20mA, 2V
- ULTRA MINIATURE SOT343 PACKAGE

### DESCRIPTION

The START620 is a member of the START family that provide market with the state of the art of RF silicon process. It uses ST's Silicon Germanium technology. This technology offers  $f_t$ 's of up to 45GHz and  $F_{max}$ 's of over 60GHz. The START620 offers the best mix of gain and NF for given breakdown voltage ( $BV_{ceo} = 3.3\text{V}$ ). It reaches performance level only achieved with GaAs products before.



SOT343 (SC70)

**ORDER CODE**  
START620TR

**BRANDING**  
620

### APPLICATIONS

- LNA FOR GSM/DCS, CDMA, WCDMA, BLUETOOTH
- GENERAL PURPOSE 500MHz-5GHz

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{ceo}$	Collector emitter voltage	3.3	V
$V_{cbo}$	Collector base voltage	10	V
$V_{ebo}$	Emitter base voltage	1.5	V
$I_c$	Collector current	40	mA
$I_b$	Base current	4	mA
$P_{tot}$	Total dissipation, $T_s = 101$	135	mW
$T_{stg}$	Storage temperature	-65 to 150	°C
$T_j$	Max. operating junction temperature	150	°C

### ABSOLUTE MAXIMUM RATINGS

$R_{thjs}$	Thermal Resistance Junction soldering point	270	°C/W
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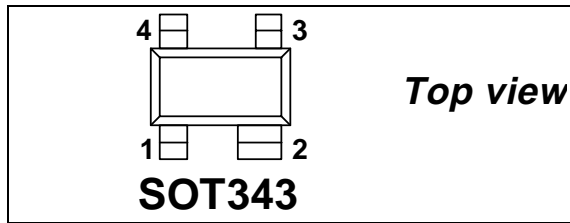
## START620

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub>=25 °C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>obo</sub>	Collector cutoff current	V <sub>cb</sub> = 8V, I <sub>e</sub> = 0A			150	nA
I <sub>ebo</sub>	Emitter-base cutoff current	V <sub>eb</sub> = 1.5V, I <sub>c</sub> = 0A			15	μA
H <sub>fe</sub>	DC current gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V		100		
NF <sub>min</sub>	Minimum noise figure	I <sub>c</sub> = 5mA, V <sub>ce</sub> = 2V, f = 1.8GHz, Z <sub>s</sub> = Z <sub>s</sub> opt		0.8		dB
G <sub>a</sub>	NF <sub>min</sub> associated gain	I <sub>c</sub> = 5mA, V <sub>ce</sub> = 2V, f = 1.8GHz		14.5		dB
S <sub>21</sub>   <sup>2</sup>	Insertion power gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		16.2		dB
G <sub>ms</sub> <sup>(1)</sup>	Maximum stable gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		18.6		dB
P <sub>-1dB</sub>	1dB compression point	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		13		dBm
OIP <sub>3</sub>	Output third order intercept point	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		23		dBm

Note(1): G<sub>ms</sub> = |S<sub>21</sub> / S<sub>12</sub>|

### PINOUT



### PIN CONNECTION

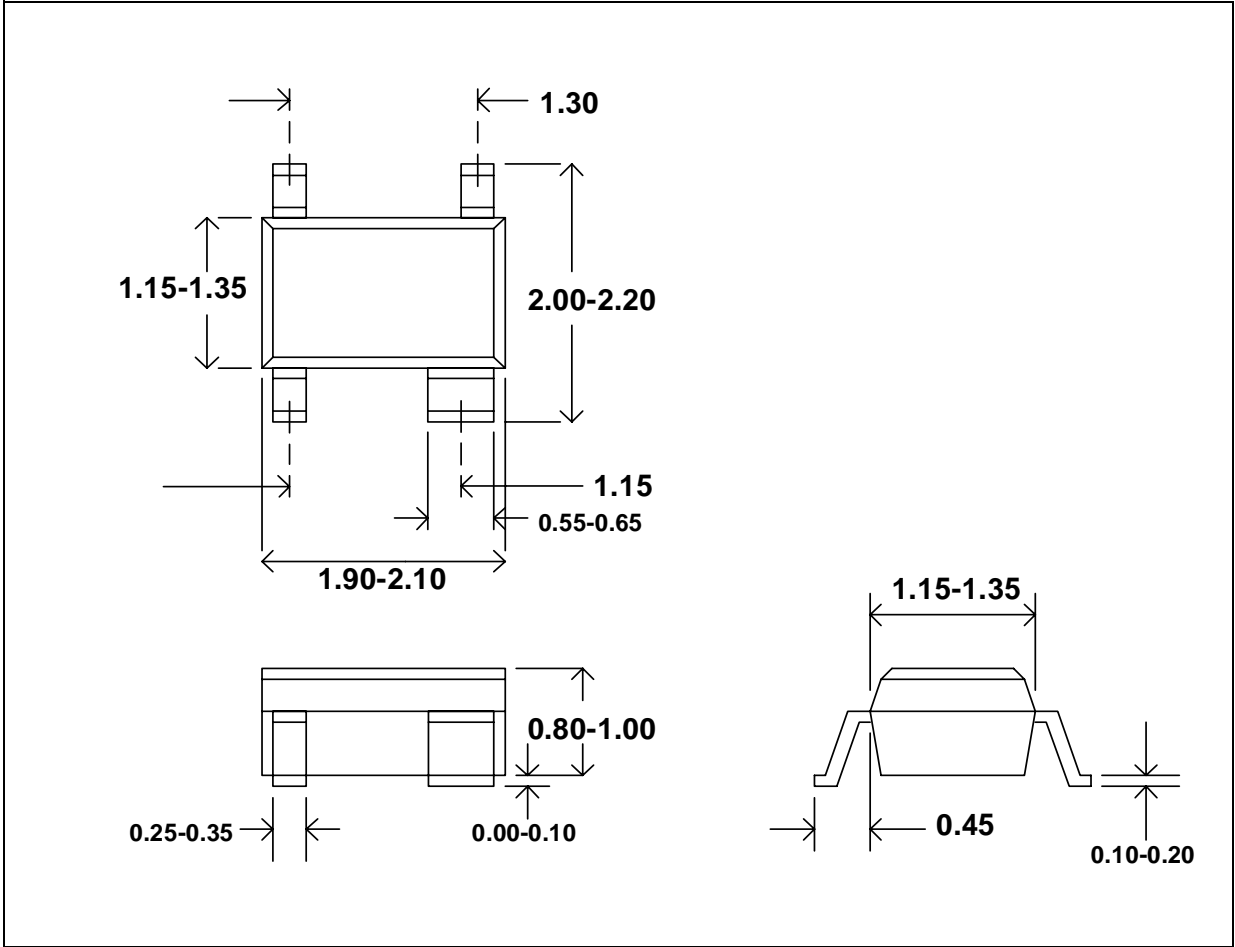
Pin No.	Description
1	BASE
3	COLLECTOR
2,4	EMITTER

**COMMON EMITTER S-PARAMETERS** (  $V_{CE} = 2V$ ,  $I_C = 20mA$  )

FREQ (MHz)	$ S_{11} $	$S_{11}\angle\Phi$	$ S_{21} $	$S_{21}\angle\Phi$	$ S_{12} $	$S_{12}\angle\Phi$	$ S_{22} $	$S_{22}\angle\Phi$
0.1	0.505	-21	35.490	163	0.009	80	0.940	-14
0.5	0.322	-69	19.713	134	0.030	84	0.611	-38
0.9	0.245	-88	12.607	130	0.048	100	0.484	-43
1	0.237	-92	11.751	130	0.052	102	0.470	-44
1.5	0.193	-97	7.564	133	0.071	118	0.430	-46
1.8	0.188	-95	6.534	139	0.088	127	0.443	-48
2	0.190	-89	5.834	144	0.093	133	0.449	-49
2.5	0.218	-76	4.639	154	0.109	148	0.497	-55
3	0.219	-86	3.688	165	0.160	170	0.455	-66
3.5	0.209	-80	3.537	172	0.181	174	0.412	-73
4	0.195	-89	3.006	180	0.200	173	0.355	-80

**START620**

**PACKAGE DIMENSIONS SOT343 (SC-70 4 leads)**



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